

Claims:

1. A tissue growth guide comprising,
5 an inner core comprising a biopolymer matrix having one or more cells positioned therein, the guide further comprising;
an outer sheath surrounding said inner core,
said inner core being fixed to said outer sheath at a first attachment region and a second attachment region;
10 such that said cells produce mechanical tension in said core between the first and second attachment regions.
2. A guide according to claim 1 wherein said the mechanical tension in said core causes alignment of the cells.
15
3. A guide according to claim 1 or claim 2 wherein said the mechanical tension in said core causes alignment of the fibres of said biopolymer matrix.
- 20 4. A guide according to any one of the preceding claims wherein the biopolymer matrix is a collagen matrix.
5. A guide according to any one of the preceding claims adapted for use as an implant in the repair of damaged tissue
25
6. A guide according to claim 5 wherein the sheath comprises one or more entry ports for entry of regenerating tissue
7. A guide according to claim 5 or claim 6 adapted for the
30 regeneration of nerves.
8. A guide according to claim 7 wherein the sheath comprises an entry port for entry of regenerating nerve and an exit port for exit of a regenerating nerve.
35

9. A guide according to claim 8 comprising one or more fixings for fixing in place the entry point adjacent to the proximal end of a damaged nerve and the exit point at the distal end of a damaged nerve.

5

10. A guide according to any one of claims 5 to 9 wherein the mechanical tension in the core imparts traction on regenerating tissue in the guide

10 11. A guide according to any one of the preceding claims wherein said cells comprise one or more of Schwann cells, neural fibroblasts, fibroblasts, tenocytes, astrocytes, osteoblasts, myoblasts, melanocytes, smooth muscle cells, secretory or gland vessel cells, epithelial cells and endothelial cells.

15

12. A guide according to any one of the preceding claims wherein said cells comprise Schwann cells and fibroblasts.

13. A guide according to any one of the preceding claims wherein
20 said sheath is biosorbable.

14. A guide according to any one of the preceding claims wherein said sheath is non-porous.

25 15. A guide according to any one of claims 12 to 14 wherein said sheath is selected from the group consisting of silicone, phosphate glass, polylactone, polyglycone, polycapryolactone, hyaluronan or derivatives thereof, collagen, fibrin, fibronectin, cellulose, chitosan, and starch.

30

16. A guide according to any one of the preceding claims wherein the sheath is mechanically fixed to the core at the first and second attachment regions.

17. A guide according to claim 16 wherein said outer sheath is shaped to cooperatively engage the inner core at the first and second attachment regions to prevent co-axial movement of the core relative to the sheath.

5

18. A guide according to claim 17 wherein said sheath comprises one or more openings which cooperatively engage the inner core at the first and second attachment regions.

10 19. A guide according to claim 18 wherein said openings comprise a plurality of pores.

20. A guide according to claim 18 wherein said openings comprise one or more holes in the sheath.

15

21. A guide according to any one of claims 1 to 15 wherein the sheath is chemically fixed to the core at the first and second attachment regions.

20 22. A guide according to any one of claims 1 to 4 adapted for in vitro use as a bioreactor for the growth of tissue

23. A method of making a guide for tissue growth comprising;
providing an outer sheath,

25 introducing cells to a liquid biopolymer matrix,
introducing said liquid matrix to the interior of the outer sheath,

causing or allowing said liquid matrix to set; and,
fixing the matrix to the sheath at a first and second

30 attachment region.

24. A method according to claim 23 wherein the sheath cooperatively engages the matrix at the first and second attachment regions, said engagement preventing co-axial movement
35 of the core relative to the sheath.

25. A method according to claim 23 or claim 24 comprising causing or allowing the cells within said matrix to generate mechanical tension between the first and second attachment regions.
26. A method according to any one of claims 23 to 25 comprising implanting said guide into a human or animal body.
27. A method according to any one of claims 23 to 26 wherein the cells comprise fibroblasts and one or more cells of said tissue.
28. A method according to any one of claims 23 to 27 wherein the tissue cells comprise fibroblasts and one or more stem cells or progenitor cells of cells of said tissue.
29. A method of repairing tissue damage comprising linking a first and a second end of a guide according to any one of claims 1 to 21 to the broken ends of a damaged tissue in an individual, and allowing said tissue to regenerate through said guide.
30. A method according to claim 29 wherein the damaged tissue is a nerve.